



Endogenous hormonal equilibrium linked to bamboo culm development

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ABSTRACT. Moso bamboo (*Phyllostachys heterocycla*) is the most important bamboo species in China and is famous for its fast-growing culms. To investigate the possible relationship between internode development and endogenous hormones, the concentrations of indole-3-acetic acid (IAA), zeatin riboside (ZR), gibberellins (GA₃), and abscisic acid (ABA) were analyzed in culm samples from plants at different developmental stages during a single growing season and, at the same time, anatomical structure was closely monitored. Cell division was the dominant process in internode development during early development, while cell elongation predominated at later stages. There was a negative correlation between the rates of cell division and cell elongation. The four endogenous hormones (IAA, ZR, GA₃, and ABA) displayed fluctuations in their levels at different developmental stages but their peak activities were not synchronous. Cell division rate had a significant positive correlation with ZR concentration. Cell elongation had a significant positive correlation with the ratio of promoting hormones (IAA, GA₃, and ZR) to inhibitory hormone (ABA) concentrations. We conclude

that hormonal equilibrium might regulate the division and elongation of bamboo culms.

Key words: *Phyllostachys heterocycla*; Internode elongation; Plant hormones; Cell length; Cell division